

PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

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PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing (day/month/year)		30.01.2001
Applicant's or agent's file reference 293		REPLY DUE within 3 month(s) from the above date of mailing
International application No. PCT/GB00/00556	International filing date (day/month/year) 17/02/2000	Priority date (day/month/year) 17/02/1999
International Patent Classification (IPC) or both national classification and IPC H04B1/707		
Applicant KINGS COLLEGE LONDON et al.		

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain document cited
 - VII ☒ Certain defects in the international application
 - VIII ☒ Certain observations on the international application
3. The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 17/06/2001.

Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer / Examiner Bauer, F Formalities officer (incl. extension of time limits) Teschauer, B Telephone No. +49 89 2399 8231
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I. Basis of the opinion

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".*):

Description, pages:

1-8 as originally filed

Claims, No.:

1-8 as originally filed

Drawings, sheets:

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims
Inventive step (IS)	Claims 1-8
Industrial applicability (IA)	Claims

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item V

1. Reference is made to the following documents:
 - D1: OJANPERA T ET AL: 'Qualitative comparison of some multiuser detector algorithms for wideband CDMA' IEEE VEHICULAR TECHNOLOGY CONFERENCE, XX, XX, vol. 1, 1998, pages 46-50-50vol1
 - D2: KOULAKIOTIS D ET AL: 'EVALUATION OF A DS/CDMA MULTIUSER RECEIVER EMPLOYING A HYBRID FORM OF INTERFERENCE CANCELLATION IN RAYLEIGH-FADING CHANNELS' IEEE COMMUNICATIONS LETTERS, US, IEEE SERVICE CENTER, PISCATAWAY, US, vol. 2, no. 3, 1 March 1998 (1998-03-01), pages 61-63, ISSN: 1089-7798 cited in the application
2. All claims have been, as far as possible, interpreted using the description (see Item VIII).
3.
 - a) D2 discloses, as already acknowledged on page 3 of the description of the present application, a method for reducing interference between users of a carrier signal in which all users have the same bit rate (the same processing gain of 36 is used for all users) and have their interference reduced by HIC.
 - b) The difference between this disclosure and the subject-matter of claim 1 is that the later applies to systems with users having a higher and users having a lower bit-rate and discloses to apply HIC first to the high bit-rate users and then to the lower bit-rate users.
 - c) Thus, beginning from D2, the problem solved by the claimed invention could be seen in adapting it to a multi-rate system.
 - d) The skilled man would then have a look at documents concerned with interference cancellation in multi rate systems. D1 is such a document. It explains that, in variable spreading factor schemes (i.e. multi rate) the processing gain is varied according to the data rate. Therefore, the power of a high bit rate user is higher than the power of a low bit rate user. (D1, page 46, second column, lines

14-20). Moreover, D1 proposes, in order to solve those problems (page 49, right column, line 45 - page 50, left column), to apply two cancellation stages, and "to weight or not to consider at all the low bit rate users in the first stage" (page 50, left column). In the second stage, the low bit-rate users are considered.

The skilled man, applying this teaching to the HIC technique known from D2, would first apply HIC to the high bit rate users and then apply HIC to the low bit rate users, thus arriving to the subject-matter claimed in claim 2.

e) Therefore, the subject-matter of **claim 1** of the present application cannot be considered as involving an inventive step (Article 33(3) PCT).

4. The subject-matter of **claims 2-8** of the present application cannot be considered as involving an inventive step for the following reasons (Article 33(3) PCT).

Claims 2 and 6-8: Claims 3-7 consist merely in the juxtaposition or association of known (e.g. from D1 or D2) devices or characteristics functioning in their normal way and not producing any non-obvious working inter-relationship.

Claims 3 and 4: The only two obvious possibilities are to cancel the signal at the baseband or to cancel the modulated signal, i.e. at the matched filter output.

Claim 5: This claim attempts to define the subject-matter in terms of the result to be achieved, without mentioning any technical feature.

5. It is not at present apparent which part of the application could serve as a basis for a new claim that would meet the requirements of Article 33(2) and (3) PCT. Should the applicant nevertheless regard some particular matter as meeting those requirements, following should be taken into account by the applicant :
- the applicant should indicate in the letter of reply the difference of the subject-matter of the new claim vis-à-vis the state of the art (D1 and D2) and the significance thereof.
 - a new independent claim should be put in the two-part form in accordance

with Rule 6.3(b) PCT, with those features known in combination from the prior art (document D2) being placed in a preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in a characterising part (Rule 6.3(b)(ii) PCT).

- the applicant should be aware not to extend the subject-matter of the application as originally filed (Article 34(2)(b) PCT).

In order to facilitate the examination of the conformity of the amended application with the requirements of Article 34(2)(b) PCT, the applicant is requested to clearly identify the amendments carried out, no matter whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based (see also Rule 66.8(a) PCT).

If the applicant regards it as appropriate these indications could be submitted in handwritten form on a copy of the relevant parts of the application as filed.

Re Item VII

1. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
2. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D2 is not mentioned in the description, nor is this document identified therein.
3. The claims are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document D2) being placed in a preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in a characterising part (Rule 6.3(b)(ii) PCT).

Re Item VIII

1. The meaning of "between" in **claim 1**, page 9, line 6 is not clear (Art. 6 PCT). Is it

meant that then the interference of the other lower bit rate users is reduced?

2. In **claim 2**, it should be written what PIC stands for. It should be as well clarified, according to the description (page 4, lines 1-2), what is meant by "the most reliable users". Last, it should be written that the signals corresponding to the most reliable users, and not the users themselves are selected.
3. In **claims 3 and 4**, all the definite articles "the" are applied to terms that were not defined in any of the previous claims. Un indefinite article should therefore have been employed, and the terms "regenerated signals", "cancelled", "received signals", "remaining users" and "cross correlations" should be defined and clarified in the claims.
4. **Claim 5** does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The claim attempts to define the subject-matter in terms of the result to be achieved (a substantially complete cancellation) which merely amounts to a statement of the underlying problem. The technical features necessary for achieving this result should be added.
5. In **claim 6**, the expression "complex HIC" should be clarified, as it does not seem to be a wide-used method.
6. In **claim 7**, the difference between "HIC with the best BER" and "HIC" should be clarified, because this is the only characterising feature of this claim.
7. In **claim 8**, the expression "H-H-1" and "L-P-S" should be clarified, as they do not seem to be wide-used expressions. Moreover, they represent the only characterising feature of this claim.